VI. *A new Kind of Hydrometer made by Mr.* Clarke, *and communicated to the Society by* J. T. Deſaguliers, *L. L. D. F. R. S.*

THE Hydrometer, by ſome called Areometer, is an Inſtrument commonly made of Glaſs, as repreſented by Figure 1, conſiſting of a Stem A B, graduated by ſmall Beads of Glaſs of different Colours, ſtuck on the Outſide, a larger Ball, B, quite empty as well as the Stem, and a ſmall Ball, C, filled with Quickſilver before the End A, was hermetically ſealed, in ſuch Manner as to make the Hydrometer ſink in Rain Water as deep as *m*, the Middle of the Stem. Such an Inſtrument does indeed ſhew the different ſpecifick Gravity of all Waters or Wines, by ſinking deeper in the lighter, and emerging more out of the heavier Liquors; but as it is difficult to have the Stem exactly of the ſame Bigneſs all the Way, and if it could be had, the ſame Inſtrument would not ſerve for Water and Spirits, ſinking quite over Head in Spirits when made for Water, and emerging in Water with Part of the great Ball out, when made for Spirits. The Hydrometer has only been uſed to find whether any one Liquor is ſpecifically heavier than another; but not to tell how much, which cannot be done without a great deal of Trouble, even with a nice Inſtrument. The Hydroſtatical Balance has ſupplied the

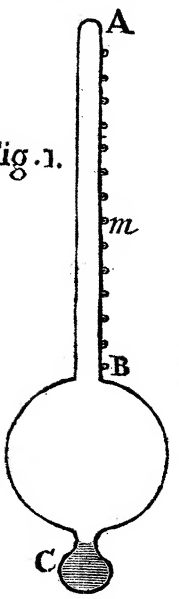
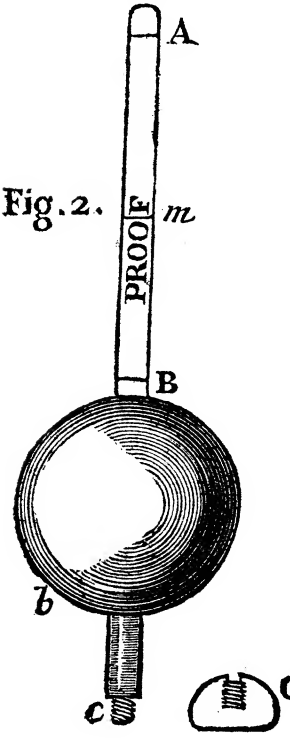


Fig. 1.

Place

Place of the Hydrometer, and ſhews the different ſpecifick Gravity of Fluids to a very great Exactneſs. But as that Balance cannot well be carried in the Pocket, and much leſs managed and underſtood by Perſons not uſed to Experiments, Mr. *Clarke* was reſolved to perfect the Hydrometer for the Uſe of thoſe that deal in Brandies and Spirits, that by the Uſe of the Inſtrument they may, by Inſpection, and without Trouble, know whether a ſpirituous Liquor be Proof, above Proof, or under Proof, and exactly how much above or under: And this muſt be of great Uſe to the Officers of the Cuſtoms, who examine imported or exported Liquors.

Fig. 2.



After having made ſeveral fruitleſs Trials with Ivory, becauſe it imbibes ſpirituous Liquors, and thereby alters its Gravity, he at laſt made a Copper Hydrometer, repreſented by *Fig.* 2, having a Braſs Wire of about $\frac{1}{4}$ Inch thick going through, and ſoldered into the hollow Copper Ball, B *b*. The upper Ball of this Wire is filed flat on one Side, for the Stem of the Hydrometer, with a Mark at *m*, to which it ſinks exactly in Proof Spirits. There are two other Marks, A and B, at Top and Bottom of the Stem, to ſhew whether the Liquor be $\frac{1}{10}$ above Proof (as when it ſinks to A) or $\frac{1}{10}$ under Proof (as when it emerges

ges to B) when a Braſs Weight, ſuch as C, has been ſcrewed on, to the Bottom at *c*. There are a great many ſuch Weights of different Sizes, and marked to be ſcrewed on, inſtead of C, for Liquors that differ more than $\frac{1}{16}$ from Proof, ſo as to ſerve for the ſpecifick Gravities in all ſuch Proportions as relate to the Mixture of ſpirituous Liquors, in all the Variety made Uſe of in Trade. There are alſo other Balls for ſhewing the ſpecifick Gravities quite to common Water, which makes the Inſtrument perfect in its Kind.

VII. *An Account of an* Aurora Borealis *attended with unuſual Appearances, in a Letter from the Learned Mr.* G. Cramer, *Prof. Math.* Genev. *to* James Jurin, *M. D. and F. R. S.*

I Have been ſo overcharged with Buſineſs ſince I came here, that I had hardly Time enough to think of writing.

Being now a little more at Leiſure, I would not miſs the Occaſion of an *Aurora Borealis*, which appeared here the 15th of *Feb.* N. S. accompanied with ſome Circumſtances rare enough to be worth your Conſideration.

The *Aurora* it ſelf had nothing extraordinary; it was a quiet one, that is, without any ſenſible Motion, except, perhaps, an alternative Increaſe and Diminution of apparent Altitude. Whether it was for this Reaſon, or becauſe the Light had its Edge imperceptibly confounded with the Colour of Heaven, ſeveral People judged of that Altitude ſeverally. There are ſome that